

resort for birds of all kinds, and was probably a favourite abode of Dodos and marsh-birds.

Aged persons who have passed their lives in the woods have assured me that there was formerly a sufficiency of wild fruits to maintain any number of birds large enough to eat them, and that there was such a succession of them as would have sufficed for the whole year. Among these fruits may be mentioned *Ficus rubra*, *F. terebrata*, and *F. mauritiana*, three or four species of ebony, the iron-wood, several species of *Mimusops*, *Olea chrysophylla* and *O. lancea*, *Calophyllum tatamahaka* and *C. spectabile*, *Mithridatea amplifolia*, *Terminalia mauritiana*, *Colophonia mauritiana*, *Tossinia mespiloides* and *T. revoluta*; and I think it likely that the seeds of several species of *Pandanus*, notwithstanding their hardness, may have been eaten by birds whose digestive powers we may imagine to have been equal to those of the Ostrich.

If the Dodo ate animal food, I know of nothing coexistent with it in Mauritius that could have afforded it any considerable supply, except snails, of which the woods which remain still contain vast numbers.

I have opened diggings in several marshes which appeared to me likely receptacles for the relics of the Dodo, but I have not found a single bone except in the Mare aux Songes. Several gentlemen, witnesses of my success there, have made experiments in other places, but have obtained nothing.

Having sent to Professor Owen and Mr. Alfred Newton bones of every kind that I have found, I do not think it necessary to enter into any description of them here, but I hope my communication may still be found sufficiently interesting.

Mahébourg, January 6, 1866.

XIV.—*On some Extinct Gigantic Birds of the Mascarene Islands.*

By H. SCHLEGEL, Director of the National Museum of the Netherlands, F.M.Z.S., &c. &c.

[The interesting events of the last few months, which have done more to put us in possession of facts relating to the extinct birds of the Mascarene Islands than anything else that has

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happened, at least since the publication of Mr. Strickland's well-known work, have naturally excited much attention among ornithologists. We therefore take occasion to present our readers with a translation of the valuable paper contributed in 1857 to the Royal Academy of Sciences of Amsterdam\*, which, being originally written in the Dutch language, is probably unknown to the majority of them, though a translation into German of part of it appeared in the 'Journal für Ornithologie' for 1858. Its reproduction here will of course not be taken as necessarily involving our entire acquiescence in all the opinions of the writer; but at the same time we think it advisable that English naturalists should not be unacquainted with Professor Schlegel's views.—ED.]

THE islands of Bourbon [Réunion], Mauritius, and Rodriguez, which form a natural geographical group and can be classed together under the name of the Mascarene Islands, have been (especially in recent times) the subject of repeated inquiries respecting the large birds which have become extinct, or rather have been extirpated, within the last century or two, and which formerly inhabited these islands, but are not met with in other regions of the globe. Every one knows that the species of these birds hitherto with more or less certainty determined are regarded as belonging to one group only—that of the Dodos, so named because the large species, that of the island of Mauritius, the Dodo proper, is the best known and is especially the most remarkable from the size and shape of its bill. Every one knows, also, that these birds have given rise to several singular, nay even extraordinary, opinions concerning their true form, and that they from the first have attracted the surprise of the unlearned as well as of naturalists.

It will perhaps cause new surprise when I now announce that, notwithstanding these frequent investigations, some large birds formerly existing on the islands above named have been overlooked or mistaken, and that one of them was a species which, in height at least, equalled the African Ostrich, and, further, that it did not belong to the Dodos, but to quite another order of birds.

\* Verslagen en Mededeelingen der Koninklijke Akademie van Wetenschappen. Afdeeling *Natuurkunde*, vol. vii. p. 116.



Remains of these birds have not hitherto been found; but we know them from descriptions and a representation, which perhaps may, if rightly understood, give a better and more complete idea of these beings than the obscure sketch which can be obtained of the New Zealand Moas through their numerous remaining bones.

The description and representation of the largest species, called by Leguat "*Géant*," is given by that traveller in his narrative\*, a work which, notwithstanding all my former trouble, I have not been able to see till now, and then in both editions together. Before we consider these important documents more closely, we will first examine how far their author deserves the trustworthiness we ascribe to him. To do this properly we must give a concise account of the life and labours of this little-known man, who has deserved the thanks of science.

FRANÇOIS LEGUAT, a French gentleman of the then small province of Bresse†, in Burgundy, after being deprived of his liberty for four years, through the revocation of the Edict of Nantes, was compelled at last to quit his native country. Like many other French refugees of that time he repaired to Holland, where he arrived 6th August, 1689. Here he learned that the Marquis du Quesne, with the consent of the States General and the Directors of the East India Company, was equipping two vessels, in which the French protestants who wished to leave Europe were to be conveyed to the island of Bourbon, there to establish a colony‡. This enterprise became known§; and for fear of a fleet|| which the King of France was going to send to this

\* Voyage et Avantures de François Leguat, et de ses Compagnons, en deux isles désertes des Indes orientales. Londres, 1708. 2 vols., 8vo [12mo]. An English version of this work, in one volume, was published in London the same year.

† *Op. cit.* i. p. 157.

‡ *Ibid.* i. pp. 1, 2.

§ *Ibid.* i. p. 69.

|| Over this fleet of six vessels was set M. Guiton du Quesne, cousin to our Marquis. The account of the voyage, which lasted from 1690 to 1691, is only known to me in English under the title of 'A New Voyage to the East Indies by Mons. Duquesne.' London, 1696. 1 vol., 12mo. Afterwards appeared the journal of an unknown person who had participated in it, under the title of 'Journal d'un Voyage fait aux Indes orien-

island, it was so changed that only one ship of six guns and ten sailors was made ready for departure. This ship set sail from the Texel the 4th September, 1690. The colonists on board, eleven in number, among whom was the brother of our Leguat, were all French emigrants. Leguat, who was placed at the head of the expedition, was already more than fifty years of age\*. These colonists, with the exception of two, who had but a small fortune, were all well-to-do and of respectable condition, undertaking the voyage for their own pleasure and not through necessity†. On the 3rd April, 1691, they arrived in sight of Bourbon‡; but instead of landing there, the captain steered for the island of Rodriguez, at that time most generally called Diego-Ruys§, where he put them ashore||. After a sojourn of two years in this, till then uninhabited, island, our colonists left it in a boat, which they had themselves built, on the 21st May, 1693¶, and on the 29th of that month arrived at Mauritius, exhausted almost to death by storms and want. They then proceeded for about a week along the coast, till they came to the Zwarte River [Rivière Noire], where some Dutch families dwelt in huts. This river is twenty-eight miles (*lieues*) from the then Dutch fort Frederik Hendrik\*\*, which lay on the south-east of the island. After staying a month on this river it happened that the Governor of Mauritius, on his annual voyage round the island, arrived in this district; and it followed that he sent our Leguat and his mates to the harbour on the north-west coast, thence to depart to the governor's residence††. They remained in freedom until the 15th January, 1694; but from that time were treated as prisoners‡‡, and for a further abode were transferred to a little rocky islet lying two miles from Mauritius§§. From this islet, they

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tales par une escadre de six vaisseaux, commandez par M. Duquesne.' Rouen, chez Machouel, 1721. 3 vols., 12mo. The levity and wantonness of this narrative, which was principally composed for the then French Minister of Marine, De Seignelai, contrasts very strongly with the earnestness, simplicity, and honesty which mark Leguat and his companions.

\* *Op. cit.* i. pp. 3-7.

† *Ibid.* i. p. 69.

‡ *Ibid.* i. p. 47.

§ *Ibid.* i. p. 49.

|| *Ibid.* i. p. 60.

¶ *Ibid.* i. p. 164.

\*\* [Very nearly the site of what is now Mahébourg.—TRANSL.]

†† *Op. cit.* ii. pp. 8-12.

‡‡ *Ibid.* ii. p. 21.

§§ *Ibid.* ii. p. 25.



could, at low water, during full and new moon, go to two neighbouring islets, one of which was overgrown with trees\*. This banishment lasted more than three years, and Leguat alone was allowed, for the recovery of his health, to stay some time on Mauritius†. Subsequently, on the 6th September, 1696, they were forwarded, but still as prisoners‡, to Batavia, and then finally, but only a year later, released. Hence Leguat shipped, with his remaining companions, on the 28th November, 1697, for Europe§, and arrived in safety at Flushing on the 24th June, 1698||. Leguat afterwards established himself in Great Britain¶; and in consequence of the approval which his journal of the voyage found among his friends, he worked it up into a complete narrative, which in this new form made the round of his acquaintances, and was subsequently, in 1708, printed and published at their request\*\*. It is dedicated to the celebrated statesman the Earl Gray††, and the preface is dated London, 1st October, 1707.

From Leguat's work we find that he was a man of true refinement and much reading, that he possessed to a high degree the earnestness and piety which characterized the fervent protestants of the time, and that, by his scientific disposition and imperturbable faith, as well as by his oppression and persecution of several kinds, together with his ripe age, he had obtained that unchangeable calmness of mind from which he felt so happy at Rodriguez that, had he not been compelled, he would have never left that resting-place‡‡.

As to his love of truth, we find the contents of his work corroborated by what he says in his preface—"la simple Vérité toute nue et la Singularité de nos Avantures sont le corps et l'âme de ma Relation" §§. Among naturalists he has hitherto been known only by his account of the *Solitaire* of Rodriguez; but every one has accepted it without hesitation, and the re-

\* *Op. cit.* ii. p. 38.

† *Ibid.* ii. p. 34.

‡ *Ibid.* ii. p. 62.

§ *Ibid.* ii. p. 137.

|| *Ibid.* ii. p. 174.

¶ *Ibid.* Préf. p. xxx.

\*\* *Ibid.* Préf. p. iii-v.

†† [This is a slight and pardonable mistake of the author. The person to whom the volume is dedicated was Henry De Grey, Marquess of Kent, &c.—TRANSL.]

‡‡ *Op. cit.* Préf. p. xxx.

§§ *Ibid.* Préf. p. x.

mains of that bird, since discovered, have proved the exactness of his statements. Besides this it appears also, from the numerous observations which he communicates on known natural objects\*, that he was, as an amateur and for his time, an attentive and accurate observer, that he consulted in his investigations a multitude of works on natural history, that by comparing them mutually and with nature he tried to arrive at truth, and that he was anything but a servile repeater of another's words. When, for instance, he obtained the first flying-fish, he examined, described, represented, and compared them with the representations of other authors, discovering at once that there exists among these animals two forms, those now called *Dactyloptera* and *Exocætus*. He appends for this reason to his drawing the copies of three figures of these fish taken from other works, and on that of Olearius makes the true observation that it had probably been drawn from a dried specimen and was therefore inaccurate; for he says "quand ces animaux-là viennent à se sécher, il est difficile d'en observer la véritable forme." Not less exact are his observations on the birds which at that time were represented under the name of "Flamans." He says†, indeed, that the numerous authors whom he had consulted, except Willughby, attributed to these birds the bill of a Spoonbill; and, in fact, the name of *Flamants* was at that time generally given to large red marsh-birds. The true Flamingo was figured by Willughby, while many others, Rochefort for instance, whom Leguat respectfully quotes, described and figured the red Spoonbill of America (*Platalea ajaja*) under the name of *Flamant*. In his observations on the dorade bonito‡ he quotes Rochefort and Rondeletius, the last of whom he subsequently takes to task severely§; and on this occasion it appears that at the time of his return he took an interest in natural history; for he inserts for comparison the figure of a bonito, which one of his friends had drawn and communicated to him, from an example caught in 1702 on the coast of Kent. His description of the peculiarities of the different kinds of tortoises|| which he met with is

\* *Op. cit.* i. pp. 10 *et seq.*

† *Ibid.* i. p. 18.

‡ *Ibid.* i. pp. 20 *et seq.*

§ *Ibid.* i. p. 123.

|| *Ibid.* i. pp. 89-92.



interesting, and he did not overlook the fact that “les os de ces tortues sont massifs, je veux dire qu’ils n’ont point de moelle.” His description of the pine-apple\*, which he had never before seen, is very characteristic. Speaking of the rhinoceros†, he gives copies of five figures and criticizes the writers whose imagination led them to see several strange patterns on the hides of these animals. That he made the drawings for his work himself and *in loco* appears from his own expression‡ and from the nature of the case. Those which he says were communicated to him contrast not a little with his own by their imperfection or strangeness, as may be seen, for example, in the figure of a lizard from Gilolo, apparently a species of Gekko§.

We deem it superfluous to expatiate further on the numerous other observations which Leguat made on various animals and plants. What we have stated is sufficient to show that we have to deal with a man very different from the thousands or hundreds of thousands who have travelled, and in these days yet travel, in foreign countries for no other purpose than to find a better position than in their own land, to acquire riches in the shortest possible time, and who only observe surrounding natural objects so far as they can be of use to their material welfare. We have here before us one of the few men who have loved nature for itself and not for their own interest—one who, by a longer stay in the magnificent Mascarene Islands, would doubtless have put a stop to the work of annihilation carried on by his less-refined shipmates—since, speaking of the females of the *Solitaire* of Rodriguez, he could say “elles marchent avec tant de fierté et de bonne grace tout ensemble, qu’on ne peut s’empêcher de les admirer et de les aimer ; de sorte que souvent leur bonne mine leur a sauvé la vie”||.

That Leguat wrote his observations not after his return, but on the spot itself, appears not only from the nature of the case, but also from the statements above cited respecting the publication of his journal. Moreover he mentions also that on the islands where he lived he left “*mémoriaux*” enclosed in bottles—at Mauritius in a hole of the rock whither he was banished, at

\* *Op. cit.* ii. p. 65.

† *Ibid.* ii. p. 146.

‡ *Ibid.* i. p. 64.

§ *Ibid.* ii. p. 97.

|| *Ibid.* i. pp. 99, 100.

Rodriguez in a hole which he made in the trunk of a hard tree\*.

After having placed, as I think, the truthfulness of Leguat beyond all doubt, I pass on to his account of the bird, which I take to be an unknown gigantic species. Speaking of the productions of the island of Mauritius, he says, among other things†, “On voit \* \* \* beaucoup de certains oiseaux qu’on appelle Géans, parce que leur tête s’élève à la hauteur d’environ six pieds. Ils sont extrêmement haut montez, & ont le cou fort long. Le corps n’est pas plus gros que celui d’une Oye. Ils sont tout blancs, excepté un endroit sous l’aile qui est un peu rouge. Ils ont un bec d’oye, mais un peu plus pointu; & ses doigts des pieds separez, & fort longs. Ils paissent dans les lieux marécageux, & les Chiens les surprennent souvent, à cause qu’il leur faut beaucoup de temps pour s’élever de terre. Nous en vimes un jour un à *Rodrigue*, & nous le primes à la main tant il étoit gras: c’est le seul que nous y ayons remarqué; ce qui me fait croire qu’il y avoit été poussé par quelque vent à la force duquel il n’avoit pû résister. Ce gibier est assez bon.” This description is accompanied by a figure which represents the bird at about one twenty-fifth of its natural size. I shall now further explain this description and figure. The better, however, to do this and to obtain a more obvious idea of this bird, I have given in Figure 1 [p. 156] the representation of Leguat‡.

Let us, meanwhile, first examine what has been the opinion of other naturalists about this bird. Hamel and Strickland are, so far as I know, the only persons who have offered their opinions on the subject§. They had not the least doubt as to the existence of this large animal; nor can such be possible, since the accounts of Leguat are too precise, and he observed it on two islands at a considerable distance from each other; but they have, in our opinion, completely mistaken this bird.

\* *Op. cit.* i. pp. 67, 156; ii. p. 60.

† *Ibid.* ii. p. 72.

‡ In the lecture at the ordinary meeting of the Natural-History Section of the Royal Academy of Sciences on the 31st October, 1857, it was shown of the natural size.

§ We find also in Valentyn, V. ii. p. 152, some remarks on the *Géant* of Leguat, evidently derived from that author himself. Valentyn’s inquiry whether this *Géant* may perhaps be the Dodo needs no further explanation in our time.



Hamel\* takes it for a struthious bird which, as well as the Solitaire of Rodriguez, has been exterminated since Leguat's time. Our reasons why this opinion is entirely incorrect are the following:—1st, because the *Géant* of Leguat has a perfect tail with quills and under tail-coverts which reach to its end, and that this tail is carried erect, which is never found among the struthious birds; 2ndly, that the toes are extraordinarily long and slender, and not short and very thick as in all known struthious birds; 3rdly, that the gape by no means extends, as in the struthious birds, under the eye; 4thly, that the feet are covered over their whole length and breadth with large plates—and not partially or entirely with scales, as seen in the struthious birds; 5thly, that in Leguat's description and figure there is no appearance of the peculiar form of the feathers of the struthious birds, whereas he makes this to be so distinctly seen in his Solitaire; 6thly, that this bird lived in marshy places, where the struthious birds do not abide; 7thly, that it could fly; and 8thly and lastly, that one had been carried away by a storm from Mauritius to Rodriguez, more than a hundred [about three hundred English] miles distant—a sea-voyage which such heavy birds as the *Struthionidæ* could not possibly perform.

Strickland† has perpetually expressed the opinion that this bird has simply been a Flamingo, although the description of it gave him the impression of a Stork. This opinion is really as strange as that of Hamel; for, 1st, the physiognomy or, if you will, the *habitus* of the bird is quite different; 2ndly, neither the figure nor the description of the bill show any resemblance to that of the Flamingo‡; 3rdly, the neck of the Flamingo is

\* “Der Dodo, die Einsiedler und der erdichtete Nazarvogel” in the ‘Bulletin Phys.-Math. de l’Acad. de St. Pétersbourg,’ 1848, vol. vii. Nos. 5, 6 [pp. 65–96].

† The Dodo, &c., pp. 60 and 64. Strickland's own words are “The fact is that these *Géants* are evidently (notwithstanding the Stork-like aspect of Leguat's plate at page 171) *Flamingos*.”

‡ Leguat's expression, “ils ont un bec d'oye,” should evidently, and especially from the addition of “mais un peu plus pointu,” be understood as having reference to the form in general, and not to the *lamellæ* which the bill of the Flamingo has in common with that of the Geese. When Leguat says of his *Solitaire* (i. p. 98) “les mâles ont les pieds de coq

much longer and very much thinner than in our bird; 4thly, Flamingos have a tail which is much shorter, has a different shape, and is never carried erect; 5thly, the legs in the Flamingo are much longer and for the greater part bare, whereas in our bird they are covered with feathers pretty nearly as far as the tarsus; 6thly, the Flamingo has much shorter fore-toes, united by a swimming-membrane, and an extremely small hind-toe, whereas in our bird, both according to the figure and to the description, the toes are extraordinarily long and quite free; 7thly, the colour of the Flamingo is in the young grey, in the old more or less generally red, and never white as in our bird; 8thly and lastly, the whole of Strickland's supposition fails, seeing that, as we have mentioned above, Leguat knew very well what sort of appearance a Flamingo had.

For ourselves we do not hesitate a moment to declare that this *Géant* of Leguat's was a Waterhen, and this for the following reasons:—1st, this bird has the *habitus* of the Waterhens to such a degree that anybody who has a little experience in the recognition of animal-forms will take it for one; 2ndly, the extraordinarily long toes argue to the same conclusion; 3rdly, the form of the tail, with the under-coverts reaching to its end, and its erect attitude, is exactly as in the Waterhens; 4thly, Leguat's figure shows distinctly that the upper mandible was prolonged in a kind of rounded plate, which extended over the forehead and eyes, just as we see in the more typical Waterhens, namely *Gallinula*, *Porphyrio*, and *Fulica*; 5thly and lastly, Leguat's expressions "gibier" and "assez bon" can also be applied to the Waterhens.

When we have agreed that this bird belongs to the family of Waterhens—and I really do not know in what other group we could with any probability place it—then arises the question, under what genus of this family could we more positively arrange it. That it cannot be regarded as a Coot (*Fulica*) its toes, not bordered by lobed membranes, show. It should therefore be assigned rather to the genus *Porphyrio* or *Gallinula*;

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d'Inde, et le bec aussi," we, in like manner, do not conclude that these parts were formed exactly as in the Turkey, but that they had a general resemblance.



for one could not account it a Rail (*Rallus*), as it carries its tail erect and has a frontal plate, any more than a Crane (*Grus*), which genus is most allied to *Rallus*\*. The genus *Porphyrio*, though zoologically and geographically very natural and so very conspicuous by the more or less fine blue colour of the feathers, differs really from *Gallinula* in no other respect than in the higher bill and oval nostrils, while these in *Gallinula* are more

Fig. 1.



Fig. 2.



elongated. Since, then, the figure of our bird shows elongated nostrils, and also a bill (so far as one can determine its form in the plate, where it is represented as seen from above) which seems to have been less high than in *Porphyrio*, and, finally, since its colour is very different from that of *Porphyrio*, we must accordingly range it under the genus *Gallinula*.

We will now examine how far the exact proportion of the various parts of our bird is observed in Leguat's figure. Since

\* [Cf. Ibis, 1865, p. 533.—ED.]

even in our day, except Wolf, artists can hardly be found who are without failings in this respect, so can we much less expect that the contrary has been the case at the time Leguat lived and with a mere amateur—especially, too, as his figure represents the object in such a remarkable reduction as one twenty-fifth. We have already remarked, in our treatise on the Dodos \*, that in the existing rude drawing of that bird from Mauritius, in Van Neck's voyage, it is much more naturally and truthfully delineated than in the figures of all European artists up to this time, by whom the poor Dodo has been transformed into a real monster, and wherein the hind-toe of the foot in the foreground is always wrongly attached and stands in a crooked direction. Now, although the habitus of the *Géant* in Leguat's figure is very well drawn, although the attitude of the feet, especially of the toes (notwithstanding the representation in perspective), in this plate betrays much more study from nature and more attention than the painters of the Dodo liked to give, yet the drawing of Leguat also has its evident faults. In inspecting my copy of this figure, enlarged to the natural size, it is directly obvious that the body, instead of being the size of that of a Goose † (as Leguat's description says), almost equals that of an African Ostrich. It is quite possible that the head, which is very often represented by the best artists as too big proportionately, is also too big here, and consequently that the neck should be thinner. The same remark is perhaps to be made with regard to the feet, which should be longer just as much as the body is too thick. As it, however, would be very presumptuous to make further inferences in this respect from pure analogies, we limit ourselves here to these remarks. But in order to make them more obvious to the eye, we have prepared a new drawing of this bird of the natural size, in which

\* [Versl. en Mededeel. Konink. Akad. Amsterdam, 1854, pp. 232–256. —ED.]

† There arises, however, with me the question whether in this comparison he meant the body with, (or as sportsmen often do) without the feathers. In the last, probable case, the body will have had, as occurs in the Waterhens, from their long and loose feathers, a much more considerable bulk than that of a Goose, the feathers of which are short and closely compressed.



we have introduced the corrections just mentioned. We have here represented the bird in profile (see Fig. 2) that one may gain a better idea of this animal—especially as Leguat has so drawn the tail (apparently that it might be better shown), and not half or three-fourths turned as are the remaining parts.

When we compare this bird with other species of the Waterhen- or Rail-family, we shall observe that, although constructed precisely on their ground-plan, it differs from them in several respects, especially in its gigantic size, its tall figure, its long neck, its proportionally very small body, and its white colour. One might, for the three first reasons principally, regard it as representing the Crane-form among the Waterhens. Notwithstanding that it far exceeded in height even the largest of marsh-birds, its weight would yet be, in proportion to this extraordinary height, but very little, and with the help of its long toes it would consequently be able, as the Waterhens do, to run over marshy plains without sinking. Although it could fly, it had much trouble, according to Leguat, in rising from the ground; and its flight was doubtless slow and difficult, owing to the shortness of its wings and the length of its legs and neck. It is probable that, like all Waterhens, it could run fast, though not fast enough to escape from dogs, as Leguat states that they could catch it, and that it tried to save itself by flying up. As all marsh-birds, at least when they are obliged, can swim, and Waterhens in particular swim voluntarily and even very much, so this bird also will have swum regularly, and probably very well, owing to its light weight and the extraordinary development of its legs and long toes serving as oars. There is also no reason to suppose that its food and way of breeding would have been very different from that of the Waterhens. It was doubtless a stationary bird, being unfitted for migration; and there was no occasion for it to undertake voyages. This seems to be all that one can, with any probability, guess concerning its mode of life. Why, however, was this Waterhen so gigantic? Why was this gigantic animal just destined for such a small place on our globe—a place where were neither great rivers nor extensive marshes? Why should it be in colour entirely white, and differ in that respect from all

other species of the family\*? Human knowledge fails to answer these questions, and they will accordingly, it is probable, always remain riddles to us, the more so as this magnificent creature, like so many others, is withdrawn for ever from our gaze.

We have still another question to decide, how it comes that Leguat is the only writer who has observed this gigantic Waterhen of Mauritius, while the voyagers who visited the island before him speak of several other most remarkable birds which they met with, but not this one. To explain the fact, one must evidently infer that the voyagers only made mention of the productions which they met with in the neighbourhood of their anchoring-places, and that the giant bird of Leguat did not frequent those places, because there were no marshes. This is no doubt the case with the harbour on the south-east coast where the ships regularly came to land, and where stood, in Leguat's time and long after, the only port in the island. All travellers report that the ground then was stony and unfruitful. It was at this place that the companions of Van Neck and his successors observed the Dodo and the other birds which they describe. One must therefore suppose that Leguat and his comrades, who passed through the wildernesses lying on the other side of the island, where fowling furnished them without trouble with abundant food†, met with our gigantic bird by the rivers and marshes of these districts, while they were unknown to those who from time to time landed and again departed, as well as to the Europeans dwelling in the fort. In Leguat's

\* [Since Prof. Schlegel's paper was written, attention has been called to the White Gallinule, figured in Phillip's 'Voyage to Botany Bay,' &c., London, 1789 (p. 273), and in White's 'Journal of a Voyage to New South Wales,' &c., London, 1790 (p. 238)—a bird which is said to have formerly inhabited Lord Howe's and Norfolk Islands. This species Dr. von Pelzeln refers (Sitz. Akad. Wien, xli. p. 331) to the genus *Notornis* (Cf. Ibis, 1860, pp. 422, 423); and Mr. G. R. Gray (Ibis, 1862, p. 240) to that of *Porphyrio*. We only know of two specimens still existing, one at Vienna, obtained from the Leverian Museum, the other in the Derby Museum at Liverpool, from Bullock's collection. It would be very interesting to know if the bird is still found on either of the islands named, and we trust our ornithological friends at the antipodes will endeavour to ascertain the fact. It is the *Gallinula alba* of Latham.—ED.]

† Leguat, *op. cit.* ii. p. 9.

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time, however, there were, besides the Europeans dwelling in the fort, from thirty to forty Dutch families scattered over the island and there established\*. They lived partly by hunting, and had dogs expressly for this purpose†. These Europeans living apart, the dogs (which, as we have seen from Leguat, easily overpowered the gigantic birds), the cats, and later, perhaps, the runaway negros have probably thus silently continued the work of destruction, and also completely extirpated this remarkable animal. How quickly and secretly such a destruction can be effected is proved, among other instances, by the history of the different species of Dodos on the Mascarene Islands. Even the great Dodo of Mauritius, first made known in 1598, was no more mentioned by any traveller after 1681‡; and Leguat, who recorded so many observations on the productions of the countries which he visited, makes no mention of this strange bird. It must therefore be inferred that the Dodo, when Leguat was in Mauritius, was already extirpated, at least in the inhabited and accessible districts of the island§. Perhaps, also, the abode of this bird, in contradistinction to that of the gigantic Waterhen, was limited to the stony dry places which are round the south-east harbour, where it was observed in great numbers, and at which spot all the accounts of this bird were obtained.

\* *Op. cit.* ii. p. 64.

† *Ibid.* ii. p. 10.

‡ In 'A Coppey of Mr. Benj. Harry's Journall when he was cheif mate of the Shippe Berkley Castle Captn. Wm. Talbot then Commander,' &c., a manuscript in the British Museum (see Strickland, 'The Dodo, &c.,' p. 36), is found the last mention of the Dodo in Mauritius.

§ Leguat himself (ii. p. 71) speaks of the extraordinary decrease of the animals of the island in the following terms:—"L'Isle étoit autrefois toute remplie & d'Oyes & de Canards sauvages; de Poules d'eau; de Gelinotes; de Tortues de mer & de terre; mais tout cela est devenu rare. Les Lamentins mêmes & d'autres animaux marins se sont éloignez, depuis qu'on a commencé à leur tendre des pieges." With respect to the Dugong, which is the Lamentin of Leguat, we may observe that this large marine animal has not occurred for a long period on the coasts of the Mascarene Islands; while in Leguat's time (i. p. 95) it was found in great numbers on the coast of Rodriguez, and was so tame that a man could walk into the middle of a herd of these animals, feel them, pick out the best, and kill them on the spot or drag them to land.

It remains for us to inquire whether the *Géant* of Leguat was also found in the neighbouring island of Bourbon or elsewhere. The only writer who makes mention of a gigantic marsh-bird in Bourbon, and this under the selfsame name of *Géant*, is the Marquis du Quesne. His work, which neither Strickland nor I have been able to consult, is only known to us by a quotation in Leguat. Strickland\* says of this little work, that it is “drawn apparently as an *emigrant-trap*,” and therefore seems to attach but little value to it, or to doubt the trustworthiness of the author. From this possible suspicion we must try to exonerate a man like Du Quesne, who, as his whole life shows, stood socially and morally too high to indulge in such boastings. The Marquis du Quesne who, as a French protestant after the revocation of the Edict of Nantes, had established himself in Holland, with many others of his coreligionists, whose descendants are still living among us, and of whom his Romanist cotemporaries could say, “le grand et fameux Monsieur du Quesne, Lieutenant-Général, qui a mieux aimé renoncer au service et aux honneurs du Bâton de Maréchal de France, que d’abjurer les erreurs de Calvin”†—this Marquis du Quesne had, as we have above mentioned, formed a plan of himself establishing a colony of French emigrants in Bourbon, and on this occasion collected in writing all that was known about the island. Of this little work Leguat says‡, “Il est vrai, que cette *Rélation* pourroit être suspecte à ceux, qui pensent qu’il étoit de son intérêt de préoccuper les esprits d’une manière qui fut avantageuse à ce nouveau monde, qu’il avoit dessein d’aller habiter. Mais j’ai premièrement à dire sur cela, que M. *du Quesne* ne voulut point qu’on insérât dans ce petit Livre qu’il fit publier, aucune de ces sortes de choses, qui auroient le moindre air d’exaggeration, encore qu’elles passent pour vraies. Et j’ajouterai au second lieu, qu’à *Maurice*, à *Batavia*, & au *Cap*, je suis témoin que tout le monde convient qu’il n’y a rien dans cette *Rélation* qui ne soit très-conforme à la Vérité.”

\* The Dodo, &c., p. 60.

† See the above-mentioned ‘*Journal d’un Voyage*,’ &c., by an unknown writer. Rouen, 1721, 12mo, tom. i. p. 3.

‡ *Op. cit.* i. p. 50.



And this judgment will, we hope, be adopted by every one of us. In this little work, according to Leguat\*, the *Géans* are named among the birds of Bourbon; and we read further of them, “Les Géans sont de grands Oiseaux montéz sur des échasses, qui fréquentent les Rivières & les Lacs, & dont la chair est à-peu près du goût de celle du Butor.” That by these *Géans* the Solitaires of Bourbon cannot be meant, appears by their manner of living, and by the taste of their flesh. To determine them more precisely is not very possible, on account of the incompleteness of Du Quesne’s account; but this still shows that there lived in Bourbon a gigantic marsh-bird, which, like the Dodo, has long ago vanished, and which probably was of the same species as the *Géant* of Leguat, or related to it, since it lived by rivers and lakes; and these, with marshes, form the abode of Waterhens.

More uncertain it is whether the birds which were found in these islands by several old travellers, and by them spoken of under the names of *Flamingo* or *Passe Flamingo*, really were Flamingos, or whether under these names were comprehended the gigantic birds of Leguat, or of Du Quesne and Leguat. Herbert†, for instance, enumerates among the birds of Mauritius the “passe Flamingos;” and in Harry’s manuscript journal above mentioned occurs the name “pasca flemingos.” Dellon‡ says that in Bourbon one could catch the birds with the hand, or kill them with sticks, adding, “The only ones for which a gun is wanted were called *Flamends*—Flemings. They are as big as a young Turkey, having legs and necks four or five feet in length; the difficulty there is in catching them makes them more scarce than the rest.” Reyer Corneliszoon§ also speaks of *Flamencos* in Mauritius. It is pro-

\* *Ibid.* i. pp. 55, 56. In the English translation of this work (London, 1708), which is otherwise very accurate, and in which the original plates are copied with perfect exactness, the word *Géant* (at page 41) is translated by *Peacock*, but later (p. 171) by *Giant*.

† Relation du Voyage, &c., French translation. Paris, 1663, 4to. p. 544.

‡ Naauwkeurig verhaal van een Reyse door Indiën, &c. (Dutch translation.) Utrecht, Ribbius, 4to, 1687, p. 9.

§ Journal, p. 30.

bable, too, that Flamingos which were found in Madagascar, as Flacourt\* says, should visit Bourbon and Mauritius in their wanderings. The Giant Waterhen, on the contrary, was doubtless not found in Madagascar, since no writer mentions it.

We come now to the second extinct bird of the Mascarene Islands, which, in our opinion, has been completely mistaken by authors. This is the so-called *Oiseau bleu* of Bourbon, described in the manuscript of a certain D. B.†, where [p. 183] we read as follows:—" *Oiseaux bleus*, gros comme les *Solitaires*, ont le plumage tout bleu, le bec et les pieds rouges faits comme pieds de poules, ils ne volent point, mais ils courent extrêmement vite, tellement qu'un chien a peine d'en attraper à la course; ils sont très bons." The size of the *Solitaire* is given in the same manuscript as that of a "grosse Oye"; while Castleton, or rather Tatton‡, and Carré§, both give the *Solitaire* the size of a Turkey. Strickland's|| opinion on this bird runs as follows:—"I should have been disposed to refer the "*Oiseau bleu*" to the genus *Porphyrio*, were we not told that they were the size of the *Solitaire*, i. e. of a large Goose, that the feet resembled those of a hen, and that they never fly." These objections are, however, of no value; for, 1st, we know a species of *Porphyrio* (the *Notornis mantelli* of New Zealand) which is nearly as big as a Goose; 2ndly, there are several species of Waterhens whose feet are like those of a Hen, or, in other words, which have thick feet with toes short in proportion, as, for instance, *Tribonyx*, *Ocydromus*, and *Notornis*; 3rdly, the wings also of *Notornis* and *Ocydromus* are unfit for flight, and the quills of the last-named bird are even as soft as ordinary feathers. The guarded, though incorrect, opinion of Strickland has been followed by the strange theory of De Sélvs-Longchamps¶ concerning the *Oiseau bleu* of Bourbon; for he has referred this bird to one and the same family as the entirely

\* Histoire de la grande île de Madagascar, 1661, p. 164, under the name of *Sambe*.

† Mentioned for the first time by Strickland in the 'Proceedings of the Zoological Society' for 1844, p. 77, and afterwards in his work 'The Dodo, &c.,' p. 59.

‡ Purchas, Pilgrimes, 1625, i. p. 331. § Voyages, i. p. 12. || *Loc. cit.*

¶ Revue Zoologique, Oct. 1848, p. 3 [*potius*, p. 294].



struthious *Solitaire* of Bourbon and the Apteryx-like Dodos of Herbert and Van den Broecke, and has given it the name of *Apterornis cærulescens*. Finally, in Bonaparte\*, where, besides, the greatest confusion prevails with respect to the extinct birds of the Mascarene Islands, the *Oiseau bleu* appears in an independent genus under the name of *Cyanornis erythrorhyncha*, and there is incomprehensibly added, as a synonym of the species, the Dodo of Van den Broecke, while the Dodo of Herbert makes a second species of this compound genus.

When we attentively consider the account of the *Oiseau bleu*, every one will be disposed to admit that, though very short, it cannot be applied to any other bird than a *Porphyrio*, and especially, indeed, to the aberrant form of that genus known as *Notornis*, which we would regard as representing the galline form among the Porphyrios, particularly in consequence of the powerful figure, the thick tibiæ (clothed with feathers nearly to the extremity), the short toes, and the short, thick neck†. The supposition that this *Oiseau bleu* was such a species of *Porphyrio*, is strongly supported by the fact that the various species of the genus range from the most southern part of Europe, over the whole of Africa, Madagascar, the East Indies to further India, Australia, and New Zealand, and that thus the Mascarene Islands are contained within the geographical area of this form. That the *Oiseau bleu* was bigger than the species of *Porphyrio* known to us is an objection which will fall when we consider that *Notornis* also exceeds remarkably the remaining species; and that the southern hemisphere produces other species of the family more or less gigantic in proportion, and at the same time often different, as, for instance, *Notornis* under *Porphyrio*, *Tribonyx* and our Giant under *Gallinula*, *Fulica gigas* of Peru among the Coots, and finally the gigantic and strange *Palamedæa*, which, however, inhabit the whole of tropical America. That the *Oiseau bleu* had wings not fit for flight must not surprise us, as *Notornis* has similar wings, and as, moreover, a considerable number of other birds in the Mascarene Islands, as also in New

\* Conspectus Avium. Leiden, 8vo, ii. p. 3.

† For similar reasons we regard *Tribonyx*, or even *Ocydromus*, as the galline form of the *Gallinulæ*.

Zealand, exhibit the same peculiarity : for instance, in New Zealand, besides *Notornis*, there are *Ocydromus*, the Kiwis (*Apteryx*), and the Moas (*Dinornis*, *Palapteryx*, &c.), and in the Mascarene Islands the different species of Dodos—besides that the wings of the Giant Waterhen seem to have been shorter than is usually the case. Of the *Oiseau bleu* it is said that it ran extremely fast. Although, now, this characteristic belongs to the Waterhens in general, it is yet especially mentioned with regard to *Notornis*\*. Finally the colours of our *Oiseau bleu*, both of its feathers and its bill and feet, agree with those of *Porphyrio*, and fit, indeed, no other genus of birds of this form, size, or habits.

So much for the “*Oiseau bleu*.” We think, in our remarks on these extinct birds, that we have offered a new contribution to the better knowledge of the exceedingly interesting Fauna of the Mascarene Islands. When we now consider the nature and the distribution of these animals, in connexion with the little spots, scattered in the immeasurable ocean, which they inhabited, and then compare what we observe here and in other regions, whether close to us or far distant, new and entirely wonderful phenomena present themselves. The first that strikes us is that these islands are completely destitute of land-mammals except bats; the second, that they, in proportion to their small extent, harboured a considerable number of birds, which were characterized by their short wings and, further, by their peculiar forms or more than ordinary size; the third, that these wonderful and, in their kind, unique aberrations in this Fauna are not accompanied by similar or somewhat obvious aberrations in the Flora of these islands. Not less striking is the remark, that we see all these phenomena repeated in New Zealand†. We may thus

\* Transactions of the Zoological Society of London, vol. iv. p. 70.

† With the exception of a rat, which, however, has perhaps been introduced by ships, no mammals have been met with in New Zealand, though, according to the inhabitants, one of about two feet long lives, or has formerly lived, there. We may remark here, to prevent any possible misunderstanding, that the first voyagers to India, as appears from many passages in their writings, left on most of the islands or places where they landed all sorts of domestic animals, especially horned cattle and swine,



suppose that, in the economy of nature, the place of land-mammals is taken by birds on both groups of islands; and from this we may perhaps infer, again, why the principal birds of those localities exhibit such an extraordinary development and such peculiar forms. Both these geographical groups, in common with most other countries of the southern temperate zone, possess a multiplicity of species, and each of them restricted to certain islands or proportionately small spots; and these phenomena are, perhaps, more striking in the Mascarene Islands than in New Zealand. Both these geographical groups, the Faunæ of which (since the first principles of higher zoology are yet to be determined), for the most part, belong to the past history of the globe, deserve on this account, with the isles of the Pacific Ocean as far as the Sunda Islands, more than other regions, to become the subject of an exact investigation with regard to their fauna. Every right-minded man will regret when he observes how many of these strange and gigantic, but at the same time harmless and even useful, creatures have been extirpated in the regions above mentioned, and have disappeared for ever. He will shudder when he every moment learns that this work of destruction is yet daily being continued; and he will but too well comprehend that man entirely mistakes his earthly mission, and brutally misuses his power, when he disturbs the harmony of creation in such a deeply encroaching way that its original plan is hardly to be recognized. Such researches, however, are beyond the reach of private persons. It is the duty of a government to interfere here. If this is not done, our descendants, instead of ascribing to their forefathers that refinement which we think we have, will regard us as barbarians who only understood how to annihilate, but not to protect or preserve, what was entrusted to us by the Creator.

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the progeny of which furnished them on their later visits with provisions. They also often introduced many other animals; and by this means only can we explain, for example, how the great land-tortoise of the Galapagos has spread to Mozambique, and how Leguat, Herbert, and others speak, some of them of deer, some of monkeys, or even of white Cockatoos with red crests, among the productions of the Mascarene Islands.

The two birds now described by us may be placed in the system with the following attributes :—

GALLINULA (LEGUATIA) GIGANTEA.

“Le Géant,” Leguat, Voy. ii. p. 72, fig.

„ „ Du Quesne *apud* Leguat, *op. cit.* i. p. 55 (?).

“Straussartiger Vogel,” Hamel, Bullet. Acad. St. Pétersb. vii. No. 5 et 6 [pp. 65–96].

“Flamingo,” Strickland, ‘The Dodo, &c.’ p. 60 (note).

Stature, six feet high. Body not heavier than that of a Goose. Wings pretty short, but fit for flight. Feathers of the tibia reaching pretty close to the tarsus. Toes long and quite free, those in front about as long as the tarsus. Upper mandible extended in a plate reaching beyond the eye. General colour white, with a reddish spot under the wing. Colour of the feet and bill unknown, but probably not very remarkable, as the description does not mention it.

*Hab.* Mauritius, perhaps also Bourbon; once accidentally met with in Rodriguez.

Observed with certainty only by Leguat in 1694. Since that time not remarked again, and evidently long ago completely extirpated.

Seems to represent the Crane-type among the Waterhens.

PORPHYRIO (NOTORNIS?) CÆRULESCENS.

“Oiseau bleu,” D.B., Manuscript Journal [*penes* Soc. Zool. Lond. p. 183]; Strickland, *op. cit.* p. 59.

*Apterornis cærulescens*, De Sélys-Longchamps, Revue Zoolog. Oct. 1848, p. 3 [*potius*, p. 294].

*Cyanornis erythrorhyncha*, Bonap. Consp. Av. ii. p. 3 (*except. synon.* Did. broeckii).

Size of a heavy Goose or Turkey. Feet like a Hen’s. Colour blue. Bill and feet red. Does not fly, but runs extraordinarily fast.

*Hab.* Bourbon [Réunion].

Only observed by “D. B.” in 1669 [between 1669 and 1672]; never seen since, and apparently extirpated.

Seems, with *Notornis mantelli*, to represent the Hen-type among the Porphyrios.



## EXPLANATION OF THE ENGRAVINGS [p. 156].

Fig. 1 is a copy of Leguat's engraving.

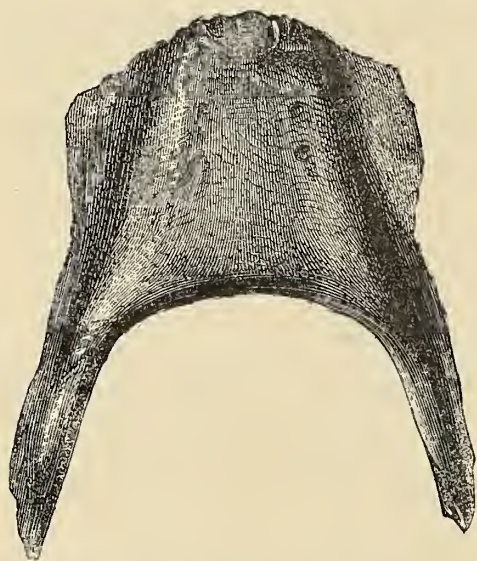
Fig. 2. The same drawn in profile, and amended from Leguat's description.

Both birds represented  $\frac{1}{25}$ th of the natural size.

1876  
252 XV.—*Evidence of a Species, perhaps extinct, of large Parrot*  
(*Psittacus mauritianus*, Owen), *contemporary with the Dodo,*  
*in the Island of Mauritius.* By Prof. OWEN, F.R.S., &c.

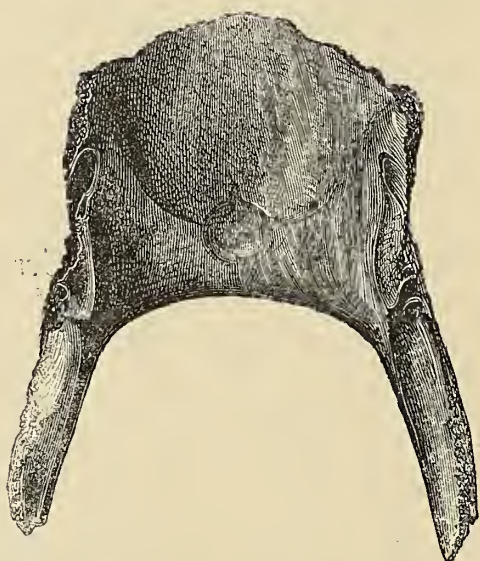
In a paper on the bones of the Dodo, read before the Zoological Society of London, January 9th, 1866, I noted a part of the lower mandible of a large Psittacine bird in the enumeration of the series of bones which had been transmitted to me by Mr. George Clark from the Mauritius.

Fig. 1.



Under or outer view of gonys,  
*Psittacus mauritianus*, Ow.  
Natural size.

Fig. 2.



Upper or inner view of gonys,  
*Psittacus mauritianus*, Ow.  
Natural size.

This specimen (figs. 1 and 2) has the same deep olive-brown tint as most of the bones of the Dodo, and, from all its physical characters, has been evidently obtained under the same conditions; it may therefore be confidently accepted as evidence of another, perhaps lost, certainly now unknown, species of bird, which formerly existed in the Island of Mauritius. Still, as in all probability the species of Parrot which the present solitary